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# Every Worker an Engineer

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## SUMMARY

The root meaning of "engineer" is one who uses his inborn creativeness in production. On this basis every worker, from executive to day laborer, should be an engineer.

Industry is so organized that many workers have been deprived of opportunity to be "engineers." The responsibility for this rests primarily upon management which has developed, with machinery, a mechanistic view of industrial organization.

Industry, existing really for man's development, should be organized to give him full freedom in the exercise of his inborn creativeness, rather than to deprive him of it. The use of such freedom is sure in the long run to be not destructive, but constructive and of benefit to society.

In the wise use of freedom men are far from equal, and so leaders are a necessity desired by all of us. True leadership depends upon ability and sincerity in service.

Men may compete in service as well as for profit. Competition for profit is economic warfare and is destructive. Competition in service is coöperation and is constructive.

Our goal of democracy in industry can be reached only by coöperation. Definite steps towards this goal are:

1. Organizations affording more mutuality of understanding and responsibility among hitherto divided groups.
2. Standards established by mutual agreement rather than by dictum.
3. More scientific approach to the problems of industry, by organized employees as well as employers.
4. Free, open channels of publicity by which the whole truth may be increasingly available and known to all interested.

THE engineer is the expert in solving the problems of our mastery over the materials and forces of nature. He has gained his power to solve these problems by acquired knowledge, technical training and experience and self-development. Engineers, on the whole, have been high-minded men, dealing with their problems on the basis of fact in a thoroughgoing, scientific way. They have rightly come to regard their calling as a profession, with a profession's fine ideals of public service and high standard of ethics. Their danger has been the class egotism and exclusiveness into which men are apt to fall when they begin to pride themselves on being experts.

The root meaning of "engineer" is one who uses his ingenuity, or natural talent, in production. Ingenuity means inborn inventiveness or creative power. This use of our inborn power gets at the heart of all work. It indicates that every worker, whatever his calling or environment, should be truly an engineer. The general adoption of this idea, together with the developed ideals of the engineering profession, would mean a revolution, but a revolution entirely constructive.

## MANAGEMENT'S RESPONSIBILITY FOR ORGANIZATION

Workers have been increasingly deprived of opportunity to use their inborn creative power in their work, not only by the development of machine processes, but also by the way our industries have been organized. The great size of modern organization,

with the increasing distance between those at the top and those at the bottom, has led to a rigid absolutism of direction from the top down, with less and less freedom and incentive for individual contribution from the bottom upward. Our organizations have become like the machinery we have invented—cleverly intricate combinations of parts, but static and lifeless until the “juice” is applied. The managers are supposed to provide the “juice.” The creativeness of the workers has had to find other channels for expression, often destructive instead of constructive.

The responsibility for this mechanistic view of industrial organization falls squarely upon management. The manager’s removal from direct contact with the man at the machine resulted in loss of faith in the man’s ability to handle the job right in his own way. He did not find means to identify the man’s inherent interest in his own way with an agreed-upon right way, nor did he work with the man for the development of a still better way. Instead, the manager used his own ingenuity to devise rules and regulations to take away the man’s freedom to exercise his ingenuity and initiative. Without this freedom, the man, feeling much like a cog in a machine, lost his sense of proprietorship in and responsibility for the job. Without these, he lost interest, and without interest he produced only when driven by the “juice” from the management. Observing this result, but not its cause, the executive lost faith not only in the man’s ability, but in his motive as well, and the vicious circle was complete. Thus the management of industry has struck effectively at the root of our tried national ideal—equality of opportunity, and the preservation of initiative.

### LEADERSHIP IN INDUSTRY

Modern industry had its origin and sole reason for being in the fact that man learned early that by group effort he could individually gain more than he could single-handedly. Consequently, industry exists only for man and his expanding life—never the other way ’round. When industry deprives him of that gain for which he associated himself with others, it sows the seed of its own destruction.

Some managers fear that men, given full freedom to use their ingenuity and initiative, will turn this freedom into destructive channels. This is the age-old argument in support of every form of repression and slavery. There may be sporadic cases of destructiveness due to inexperience in the use of a freedom of which they have been so long deprived. But, as a celebrated Englishman once said:

There is only one cure for the evils which newly acquired freedom produces; and that cure is more freedom. . . . Many politicians [and business men] of our time are in the habit of laying it down as a self-evident proposition, that no people ought to be free till they are fit to use their freedom. The maxim is worthy of the fool in the old story, who resolved not to go into the water until he had learned to swim. If men are to wait for liberty until they become wise and good in slavery, they may indeed wait forever.

The instinct of self-preservation makes men want better rather than worse conditions. Where they know what is better, they choose it; where they do not know, they follow chosen leaders. The leader differs from the led not in nature, but in the degree of his knowledge, development and resulting power. In every phase of life we all seek the leadership of the person who knows more, be he physician or priest, lawyer, scientist or engineer.

*Test of Leadership*

The test of the leader is his ability and sincerity in serving us who wish to be led. When he uses his knowledge and power to exploit us for his private gain, to become our master, sooner or later, be he soap-box orator or Kaiser, we throw off his yoke. Only as he uses his powers in our behalf can he retain our confidence. He is the trustee of our common welfare, and his fate is in our hands. "The justification of any man in the community is his trusteeship to the community" for his wealth, his learning, his power, or whatever may be his superior attainment or advantage. The true organizer or manager, whether of a union or an industry, recognizes this trusteeship. He sees in the group effort of his fellow-men the ideal opportunity and encouragement for the expansion of their individual lives. The progress of the mass depends on the progress of the individual. What hurts one, hurts all; what helps one, helps all.

## COMPETITION AND COÖPERATION IN SERVICE

"The equal chance of every one to secure that particular niche in the community to which his abilities and character entitle him is the sound philosophy these United States have been testing out for one hundred and fifty years. Its stimulus is competition." Competition is always for some sort of gain, but it is interesting to note the gradual change coming over the world in its idea of what sort of gain it desires.

The old and still largely prevailing idea of competition was to gain material wealth or volume of profit. It was "every man for himself and the devil take the hindmost." This is nothing but economic warfare, and, like all warfare, is essentially irresponsible and destructive. The gains of civil-

ization have resulted, not because of this kind of competition, but in spite of it. Growing up in the midst of competition for profit has been a competition in service, based on mutuality of interest. The truer name for this sort of competition is coöperation. In it lies the true cause of the gains of civilization, including material wealth. It is economically sound, essentially responsible and constructive. We see it in all group effort and team-work; we see it in the college football eleven; we see it no less in the great combinations of labor, of capital and of industry. Such combinations are based on the elimination of the destructive wastes of competitive warfare between the smaller units, even though the purpose be to enable the larger group to wage war more effectively. In the World War, we find coöperation—competition in service—on the largest scale the world has ever seen. Only by the united organization of their resources in food, munitions, money, and even in men, were the Allies able to win over enemies similarly coöperating. The underlying weakness of the enemy was its purpose to master the world for profit instead of to lead the world in service.

The spirit of competition in service which swept this nation during the war must not be lost. For individuals, corporations, states and nations it was conclusively demonstrated that they gain most who coöperate most. Let us, as a nation and as individuals, not lose the significance of that demonstration. We are in grave danger, by withdrawing from our opportunity and responsibility to serve the world, of losing our spiritual leadership. Such leadership can only be one of service. In the detail relations of industry this is true no less than in the affairs of nations. Those individuals and groups, whether employers or employed, who

fail to recognize and act upon this higher law of coöperation will find their power slipping away and passing to those who recognize this law. This is the bedrock of democracy, both in politics and in industry. This is the enlightened self-interest—the only kind that can ultimately succeed. This should be our goal.

#### STEPS TOWARD INDUSTRIAL DEMOCRACY

A vision of the goal is of small value without taking definite steps to get there. Every effort which brings men into closer association, with increased mutual understanding and responsibility, is a step in the right direction. Organizations of producers, consumers, employers, employees, engineers, etc., are steps, because based on mutual interest and service within the group. Their danger lies in the use of their group power to exploit other groups. Therefore, we must go a step farther. We must develop organizations bringing different groups together in coöperation. We must have not only chambers of commerce and federations of labor, but associations of industries as well, in which employers, employees and the public can broaden and strengthen mutual understanding and responsibility. The idea of unity and brotherhood emphasized in the trade union, the fraternal and the business association, must grow out of its exclusiveness and self-interest and into inclusiveness and coöperative service.

More mutuality will not reduce men to a dead-level. Merit—the degree of a man's development—will always be relative. We can, however, as another definite step towards our goal, greatly improve our methods of establishing, recognizing, and rewarding relative merit, and of determining the standards by which merit shall be gauged.

As society builds up its common law, so must each group build up its standards of merit. No individual can determine justice for another. Even our duly constituted judges are supposed merely to interpret and apply the law, not to make it. The mistaken effort of managers in the past to make, interpret, and execute the rules of their organization, or, more often, in the absence of any rules, to be judge, jury and executioner, has been a naturally prolific source of trouble.

As "government derives its just powers from the consent of the governed," so standards may properly be established only by mutual agreement. The agreement may operate in any one of several ways. In some cases it may involve the direct vote of every one concerned, as in a referendum. In other cases, it may operate through elected representatives, as in shop committees. In still other cases, it may operate as willingness to follow the decision of a recognized expert or leader, as we all follow the direction of the doctor or the traffic-cop. In whatever way agreement or consent may operate, it is always there if the standard is going to work.

The measurement of merit seems more difficult, but only because it has been given less study and effort. Merit is composed not only of physical, but also of emotional and mental qualities. Physical merit is tangible, and has long been measured by records of performance and progress in units of quantity, quality and cost. The emotional and mental qualities are less tangible, but quite as important. The higher the type of work done, the more vital do these "intangibles" become. Their evaluation, however, has been crude and haphazard, resting on either snap and admittedly prejudiced judgments by individuals, or on the belief that sooner or later a man

finds his level. Yet the medium in which each finds his level is the judgment of his fellowmen. Only the systematic recording of that judgment is needed to measure very definitely each man's level with respect to the intangibles, such as skill, reliability, and intelligence. The recent development of periodic mutual ratings has proved a practical means to this end. Such recording of emotional and mental as well as physical performance and progress affords a more complete measure of merit, and, consequently, a surer foundation for justice. When each one sees himself as others see him, and can improve his relative batting average by his own efforts, we get a demonstration of the power of public opinion as an incentive to self-development. These are but examples of definite steps in the direction of our goal of democracy.

Equal opportunity and the preservation of initiative in production are utterly ineffectual without a knowledge of the natural laws and forces with which we are dealing. As we saw in the beginning, the investigation of these laws and forces on the basis of fact instead of guess work is the science of engineering applied to production. The development of a knowledge and mastery of these laws and forces should not be confined to the professional engineer. Every worker with hand and brain may be an engineer, applying the scientific method to his own problems, and by the accumulation of facts, and the discovery of the laws and forces which underly them, he may become more and more the master instead of the slave of his environment.

Organized labor can take a great step in this respect. In the past it has been largely an onlooker in the advancement of science, and in the struggle with the problems of produc-

tion. It has left to the employer most of the initiative in the employment of men and means to achieve the mastery of nature, albeit seeking an ever larger share of the results of that mastery. There are whole ranges of natural forces being studied and utilized by the employer today that labor has let severely alone. Until organized labor definitely lines up for constructive study and the accumulation of knowledge in the science of industry and production, it can never hope to have the particular power which that knowledge gives. "Knowledge is power." As long as the employer has stores of knowledge which the employee has not, their bargaining power, whether individual or collective, will remain unequal. The sources of knowledge are equally available to all. I believe organized labor could not take a wiser or more far-sighted step than to enter into competition with employers in the service of developing the knowledge and discovering the laws on which the science and art of industry are based.

#### IMPORTANCE OF PUBLICITY IN INDUSTRY

Perhaps the greatest advance towards the goal, of value to employers, employees, and public alike, can be brought about by widening and multiplying the channels of publicity. I do not refer to paid propaganda for private profit. I refer to ways and means of making the truth easily and freely available to all. We see the power of publicity daily demonstrated. Commercial advertising pays untold sums for the privilege of using it for profit. The Belgian Relief work, the Food Administration work, the Red Cross work, in fact all the great service work of the war depended on it.

The general trend towards openness is as inevitable as it is encouraging.

Secret business methods, secret prices, secret railroad tariffs, and now secret treaties, are all passing away; crime, profiteering, graft and exploitation flourish only in secret. The criminal or the grafter, whether individual, corporate or national, fears one thing above all else—publicity of the truth. He who has nothing to hide alone is free, irrespective of wealth or position. If we think it through, we will agree that in complete openness—publicity—lies one of the potent remedies for our industrial ills. Like sunshine, it fosters healthy growth, and kills or cures the unhealthy.

The channels of publicity must be free channels, not subsidized for private ends. The only control over them must be by way of insuring their freedom. It is knowing the truth which makes us free. When the cost, quality, and quantity of the service

we are rendering are as available to those interested as “Babe” Ruth’s batting average, a man will no longer be without honor in his own country. The stimulus of competition will remain, keener than ever. But instead of competition for the most profit, it will be competition for the best showing. Compensation will not be wanting. The reward is full and un begrudged for those who excel in service.

This today is the spirit of the professional engineer. It will be the spirit of business when every worker from president to day laborer makes up his mind to be an engineer. In the vivid words of Herbert Hoover:

Unlike the doctor, his is not the struggle to save the weak. Unlike the soldier, destruction is not his prime function. Unlike the lawyer, quarrels are not his daily bread. Engineering is the profession of creation and of construction, of stimulation of human effort and accomplishment.